

NAIL CLIPPERS

by

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FIELD OF THE INVENTION

5 This invention relates to nail clippers.

BACKGROUND OF THE INVENTION

10 Nail clippers are known and used in the art. Nail clippers are used to trim fingernails and toenails of humans and other animals. Nail clippers as most commonly known and used in the art have an upper blade and a lower blade, which are substantially identical in architecture. The upper blade and lower blade are displaced towards each other, with the nail to be cut positioned
15 between the blades. The blades are displaced towards each other until contact is made with the nail, and displacement is continued until the nail is divided by the blades, and the blades contact each other.

 In nail clippers known and used in the prior art, the clippers do not provide protection from the cutting blades for skin that is in close proximity to the nail to
20 be cut. Further, in prior art nail clippers, there is no provision for enhancing cutting performance where ingrown nails, and particularly toenails, are involved.

SUMMARY OF THE PRESENT INVENTION

 The present invention is nail clippers that assist in preventing injury to the
25 skin and tissue that surround the fingernails and toenails to be cut. The nail clippers are particularly efficacious at cutting ingrown nails.

 The nail clippers are characterized by a lower tray having side dams that extend upwardly from either side of the lower tray. A nail to be cut is positioned

between the lower tray and an upper blade. The upper blade is displaced toward the lower tray, and within the side dams, until the upper blade contacts the lower tray, passing through the nail to cut the nail. A front portion of the lower tray extends outwardly and beyond the upper blade when the upper blade is closed
5 against the tray.

DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the nail clippers of the present invention.

Figure 2 is a perspective view of an additional embodiment of the nail
10 clippers of the present invention.

Figure 3A is an isolation of the nail clippers of the present invention, emphasizing, *inter alia*, the lower tray and the upper blade. The upper blade and lower tray are separated, or open in this view, whereas they are together, or closed, in **Figures 1** and **2**.

15 **Figure 3B** is an isolation of the nail clippers of the present invention, with the upper blade and lower tray held together, or closed, by a latch.

Figure 4 is a partially sectioned side elevation of another embodiment of the nail clippers of the present invention.

Figure 5 shows the nail clippers of **Figure 4**, with the upper blade partially
20 displaced toward the lower tray.

Figure 6 shows the invention of **Figures 4** and **5**, with the upper blade fully displaced to the lower tray.

Figure 7 shows the nail clippers of the present invention as shown in **Figure 6**, with the lower tray being partially sectioned.

Figure 8 is a side elevation of the nail clippers of the present invention, with the upper blade in the position shown in **Figure 6** and **Figure 7**.

5 **Figure 9** is a plan view of the nail clippers of the embodiment of **Figures 4-8**.

Figure 10 is a perspective view of an additional embodiment of the nail clippers of the present invention.

10 **Figure 11** is a side elevation of the nail clippers of **Figure 10**, with the jaws fully closed.

Figure 12 is a side elevation of the nail clippers of **Figure 10**, with the jaws in an intermediate position.

Figure 13 is a side elevation of the nail clippers of **Figure 10**, with the jaws fully open.

15 **Figure 14** is a front elevation of the nail clippers of **Figure 10**, demonstrating a replaceable blade as a phantom.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now to the drawing figures, an embodiment of the present
20 invention is shown in **Figure 1**. The nail clippers comprise an upper handle **1** and a lower handle **2**. A grip **3** may be provided for the upper handle, and a grip **4** may be provided for the lower handle. An upper blade **5** communicates with the upper handle. A lower tray **8** communicates with the lower handle.

The lower tray has a front portion which extends beyond the upper blade when the upper blade is displaced to contact the lower tray. The upper blade is sharpened on a lower edge **9**, which contacts the lower tray **8**. Side dams **6** extend from each side of the lower tray. The upper blade is positioned fully within each side dam and above the lower tray. A groove or slot **7** may be formed in the lower tray to receive the upper blade.

Each side dam extends outwardly and beyond the tray as shown in the drawing figures. Each of the side dams extends outwardly and beyond the upper blade, when the blade is closed against the lower jaw, at an angle of 30° to 60° from a centerline drawn longitudinally, or along the length of, the nail clippers, and are preferably at an angle of 45° from a centerline drawn longitudinally, or along the length of, the nail clippers

The front of the upper blade is generally perpendicular to the lower tray, so that the sharpened lower edge of the upper blade is generally perpendicular as the upper blade meets the lower tray, and/or as the upper blade meets the groove or slot that is formed in the lower tray.

The handles of the upper blade and the lower blade, are in a pivotal relationship to each other, as provided by pivot point **10**. One side **11** of the upper blade is adjacent to the side dam.

In the embodiment shown in **Figure 2**, spring biasing is provided by means of spring **12** which is attached to the upper handle and lower handle at points **13** and **13'**.

A latch may be provided, as shown in the embodiment of **Figur 2**. Latch 14 has a groove 15 therein in which pin or screw 16 travels. As latch 16 is advanced forwardly, it strikes the upper jaw at point 18, to close and latch the jaw. To use the device, the latch is moved rearwardly toward point 17, which releases the jaw. **Figure 3A**. For ease of manipulation, the edge of the latch may be scalloped and/or curved as shown. The screw may be used to hold the latch in place as desired. **Figure 3B** shows an alternative embodiment of the latch, with the latch 16 mounted within a slot. The latch traverses the slot to lock and unlock the jaw, and limit travel of the jaw as desired.

10 In use, the lower tray is inserted underneath the nail to be cut. The front portion of the tray engages the quick of the nail, and aids in alignment. One of the side dams, depending on whether the right edge or the left edge of the nail has skin or other tissue which is to be protected, is used to protect the skin or other tissue. The use of the side dam allows the nail to rest within the side dam, 15 while the tissue is outside the dam.

The front edge of the lower tray is preferred to be relatively thin, having a dimension of .015 mm to .040 mm from the blade to the front edge, so that it may be easily inserted underneath the nail.

The nail clippers cut the nail by the nail being inserted between the upper 20 blade and the lower tray. The upper blade is disposed toward the lower tray by compression of the handles, and travels toward the lower tray and through the nail until the nail is cut. Since the front of the lower tray extends beyond the blade, and the blade is recessed within the tray, and travels within the side dams,

the blade cuts the nail only, and does not cut skin or other surrounding tissue. The tray as formed, with the side dams, allows the nail to be placed within the tray, while skin and other tissue are excluded. Since the blade operates only within the tray and is not outside of the tray, or "even" with the tray, upon the nail
5 being properly positioned, only the nail is cut by the clippers, and surrounding skin is shielded by the lower tray and the side dams.

The embodiment of **Figures 4** through **9** show a different handle configuration. However, the primary elements of the device are the same as those shown in **Figures 1** through **3**.

10 As shown in **Figure 4**, this embodiment provides an upper leaf **20** and a lower leaf **21** which join each other. A lower tray **32** is provided, which has side dams **22** and **23**. An upper handle **24** is provided which allows displacement of leaf **20** toward leaf **21**, in a conventional manner. Handle **24** has a frontal portion **25** and **25'**, and a cam **26**. A void **27** permits a pivot point **28** for the handle **24**
15 and leaf **20**. The handle and the upper leaf travel along a length of guide **29**. Upper blade **30** extends from leaf **20** generally perpendicularly and toward the lower tray **32**, with the upper blade engaging groove or slot **31** as shown in **Figures 6** and **7**. In this "locked" configuration, there is no gap between the blade and the lower tray. The elimination of a gap between the blade and the
20 lower tray helps prevent the blade from tearing clothing and the like when the device is carried in a pocket in this "locked" position.

Figure 10 through **Figure 14** show an additional embodiment of the invention. The blade **102** in this embodiment is pivotally mounted to the upper

jaw **104**. The blade pivots relative to the upper jaw at a pivot point **106**, so that the blade is generally vertical at all times as it travels relative to the lower tray **108**, and while the lower tray is in the generally horizontal position shown in **Figure 11** through **Figure 13**.

5 As shown in **Figure 11**, the upper jaw is displaced fully toward the lower tray. The blade engages the slot **110** within the lower tray. In this embodiment, each of the side dams **112** has a guide **114** formed therein in which the blade travels. In a preferred embodiment, the guide is a slot that is formed in the side dams by an extension **116** that is present on the upper portion of the side dams.

10 As the upper jaw moves toward the lower jaw, the blade strikes the bottom of the groove and limits the travel of the blade. However, if blade breaks, the upper jaw strikes the lower jaw as shown in **Figure 11**, limiting the travel of the upper jaw. In this way, a toe inserted between the jaws is not injured by the jaws if the blade breaks.

15 **Figure 12** shows the blade in an intermediate position relative to the lower tray. The blade travels within the slot formed within the side dam, which may be provided by the extension in each of the side dams that are formed in the upper part of the side dam, but not the lower part of the side dams, so that they do not interfere with the insertion of the nail between the lower tray and side dam. The

20 slot guides the blade so that it maintains its generally perpendicular position relative to the lower tray. The pivotal mounting of the blade relative to the upper jaw allows the blade to maintain the generally perpendicular position by allowing the angle between the upper jaw and the blade to change as the upper jaw

travels relative to the lower tray. This is further demonstrated by **Figure 13**, wherein the upper jaw is fully retracted from the lower tray and the nail clippers are in the full open position.

As shown in **Figure 14**, when the nail clippers are in the fully open
5 position, the blade may be removed sliding it out and away from the pivotal mounting. The blade may then be replaced, or perhaps sharpened, as needed.

As shown in the embodiment of **Figure 10** through **Figure 14**, the pivotal mounting that provides the pivoting relationship between the upper jaw and lower tray is comprised of an axle **118**, and controlled by a guide **120**. The travel of the
10 guide is directed by slot **124**, which forces the upper jaw forward as the upper jaw raises, and retracts it rearwardly as the upper jaw is displaced down and toward the lower tray. This guide maintains the forward end of upper jaw, where the blade is mounted, directly above the guide for the blade that is present in the side dams, whether the nail clippers are fully closed (**Figure 11**), in an
15 intermediate position (**Figure 12**) or in a fully open position (**Figure 13**).

In order for the guide to control the position of the upper jaw relative to the lower tray, the axle must traverse a slot **122**. This feature is demonstrated as the nail clippers move through the positions shown progressively in **Figure 11**, **Figure 12** and **Figure 13**. The axle moves from a rearward position to an
20 intermediate position to a full forward position as the guide controls the movement of the upper jaw relative to the lower tray. In the preferred embodiment, the axle has a flat upper surface and a flat lower, and opposite, surface. The flat surfaces provide a larger surface for the substantial loads or

pressures that are placed upon the axle when the nail clippers are in the fully closed position, and pressure is applied to cut a nail, such a dense toenail.

Nails are typically curved at the end. The lower tray has a convex upper surface over which the nail is received for cutting. **Figure 14.** The curved lower tray provides support for the nail as the end of the nail is severed by the blade, providing a more efficient cut. The upper blade has a concave shape at the edge of the blade that conforms to the geometry of the lower tray, with substantially the same arc as the lower tray so that the blade contacts the lower tray at all points to cut the nail.